Climate, Water and Food as Security Issues in Afghanistan

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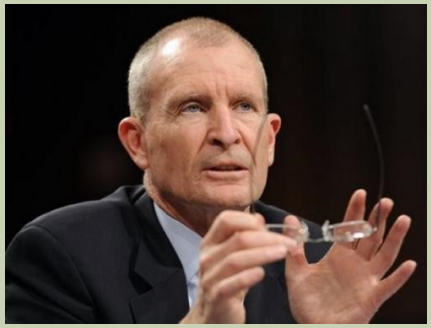
Annual Threat Assessment of the

Intelligence Community

for the Senate Select Committee on Intelligence



Environmental Security

Climate change, energy, global health, and environmental security are often intertwined, and while not traditionally viewed as "threats" to US national security, they will affect Americans in major ways. The Intelligence Community has increased its focus on these three critical issues as a result of unprecedented developments in the last year.

Dennis C. Blair

Director of National Intelligence

12 February 2009

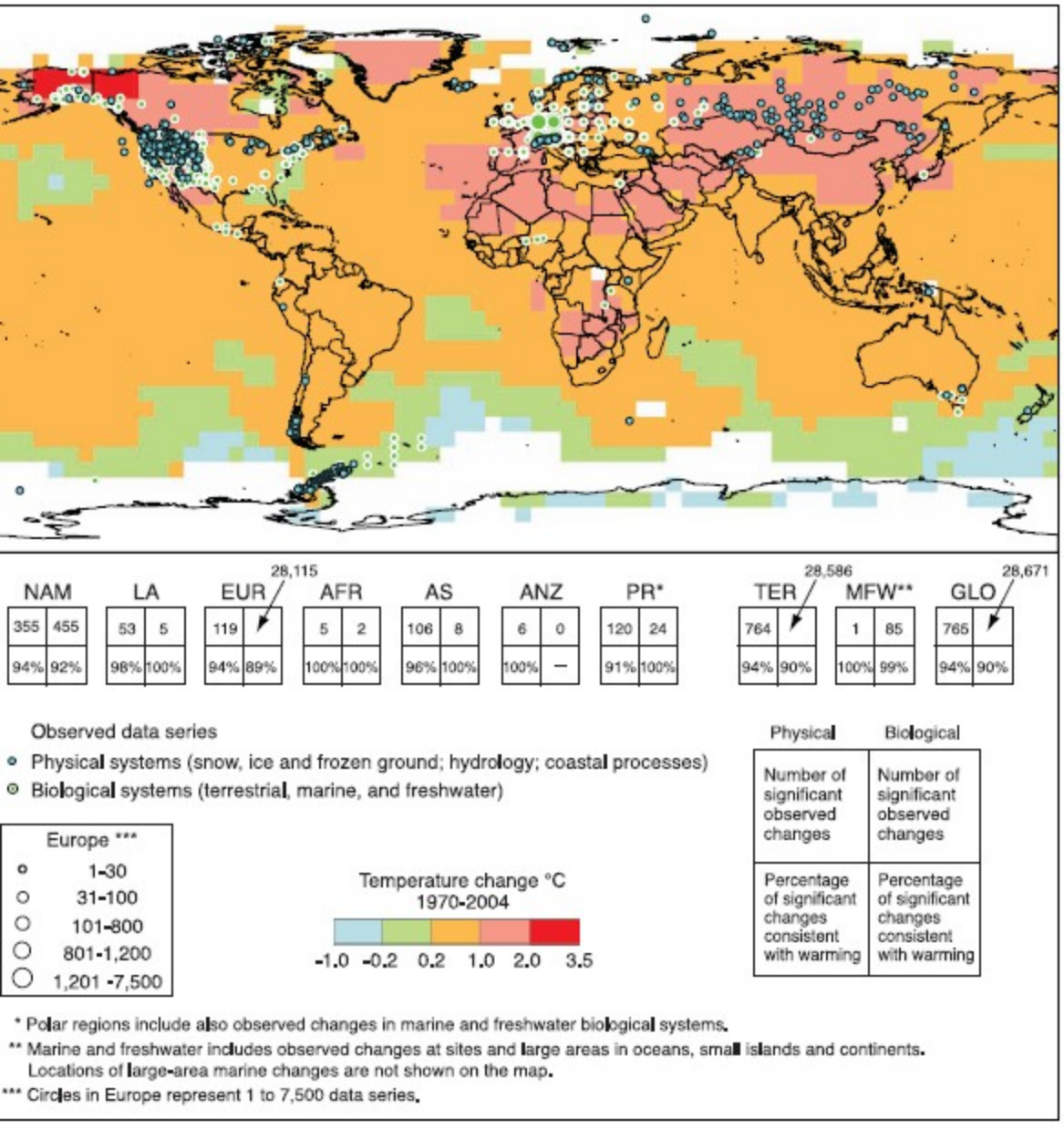
4 out of 43 pages devoted to environmental security

Evolution of knowledge about climate change and implications for conflict

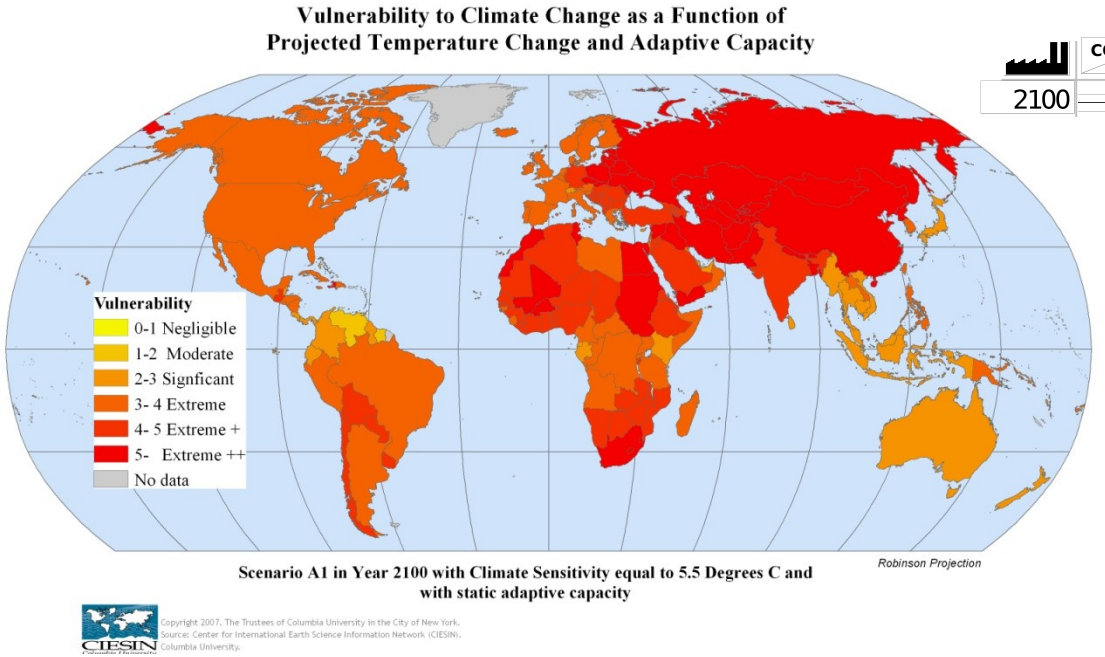
- Is climate changing?
- If so, are humans responsible?
- If so, what physical impacts can we expect?
- What socioeconomic impacts would result from those physical changes?
- What are security implications of those impacts?

Climate driven phenomena	Evidence for current impact/vulnerability	Other processes/stresses	Projected future impact/vulnerability	Zones, groups affected
a) Changes in extremes				
Tropical cyclones, storm surge	Flood and wind casualties and damages; economic losses; transport, tourism; infrastructure (e.g., energy, transport); insurance [7.4.2, 7.4.3, B7.2, 7.5].	Land use/population density in flood-prone areas; flood defences; institutional capacities.	Increased vulnerability in storm-prone coastal areas; possible effects on settlements, health, tourism, economic and transportation systems, buildings and infrastructure.	Coastal areas, settlements, and activities; regions and populations with limited capacities and resources; fixed infrastructure; insurance sector.
Extreme rainfall, riverine floods	Erosion/landslides; land flooding; settlements; transportation systems; infrastructure [7.4.2, regional chapters].	Similar to coastal storms plus drainage infrastructure.	Similar to coastal storms plus drainage infrastructure.	Similar to coastal storms.
Heat- or cold-waves	Effects on human health; social stability; requirements for energy, water and other services (e.g., water or food storage); infrastructure (e.g., energy transportation) [7.2, B7.1, 7.4.2.2, 7.4.2.3].	Building design and internal temperature control; social contexts; institutional capacities.	Increased vulnerabilities in some regions and populations; health effects; changes in energy requirements.	Mid-latitude areas; elderly, very young, and/or very poor populations.
Drought	Water availability; livelihoods, energy generation, migration, transportation in water bodies [7.4.2.2, 7.4.2.3, 7.4.2.5].	Water systems; competing water uses; energy demand; water demand constraints.	Water-resource challenges in affected areas; shifts in locations of population and economic activities; additional investments in water supply.	Semi-arid and arid regions; poor areas and populations; areas with human-induced water scarcity.
b) Changes in means				
Temperature	Energy demands and costs; urban air quality; thawing of permafrost soils; tourism and recreation; retail consumption; livelihoods; loss of meltwater [7.4.2.1, 7.4.2.2, 7.4.2.4, 7.4.2.5].	Demographic and economic changes; land-use changes; technological innovations; air pollution; institutional capacities.	Shifts in energy demand; worsening of air quality; impacts on settlements and livelihoods depending on meltwater; threats to settlements/infrastructure from thawing permafrost soils in some regions.	Very diverse, but greater vulnerabilities in places and populations with more limited capacities and resources for adaptation.
Precipitation	Agricultural livelihoods; saline intrusion; water infrastructures; tourism; energy supplies [7.4.2.1, 7.4.2.2, 7.4.2.3].	Competition from other regions/sectors; water resource allocation.	Depending on the region, vulnerabilities in some areas to effects of precipitation increases (e.g., flooding, but could be positive) and in some areas to decreases (see drought above).	Poor regions and populations.
Sea-level rise	Coastal land uses: flood risk, waterlogging; water infrastructures [7.4.2.3, 7.4.2.4].	Trends in coastal development, settlements and land uses.	Long-term increases in vulnerabilities of low-lying coastal areas.	Same as above.

IPCC summary of projected impacts



The projected changes are already being observed


Vulnerability to Climate Change as a Function of
Projected Temperature Change and Adaptive Capacity
CO2
2100
$
Vulnerability
0-1 Negligible
1-2 Moderate
2-3 Signficant
3- 4 Extreme
4- 5 Extreme +
5- Extreme ++
No data
Robinson Projection
Scenario A1 in Year 2100 with Climate Sensitivity equal to 5.5 Degrees C and
with static adaptive capacity
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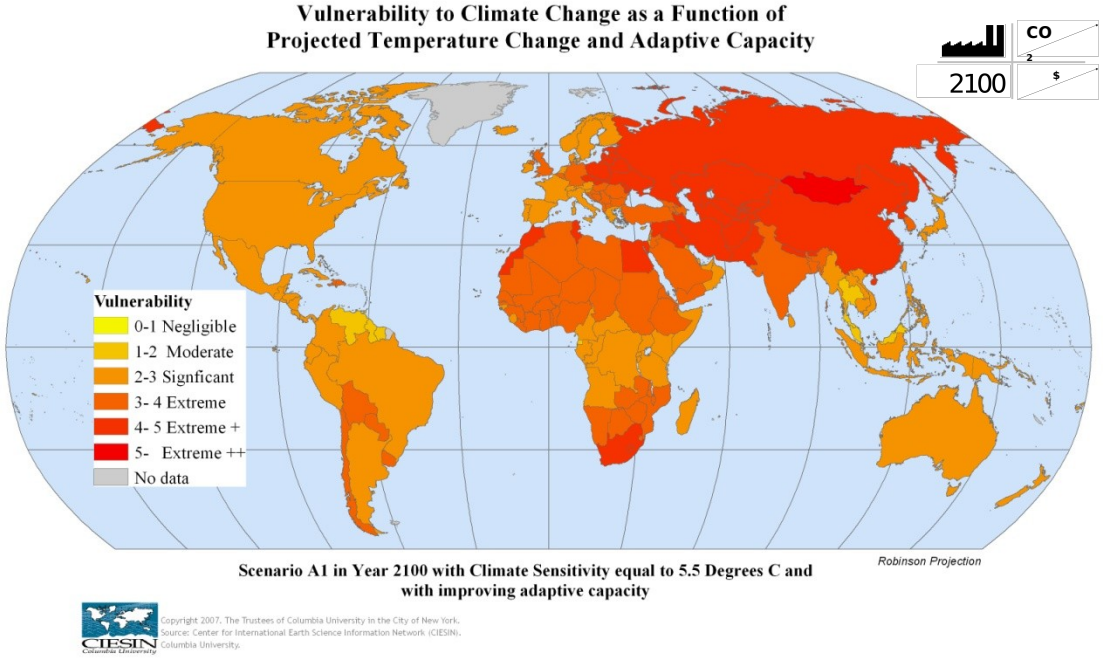
Source: Center for International Earth Science Information Network (CIESIN),
Columbia University.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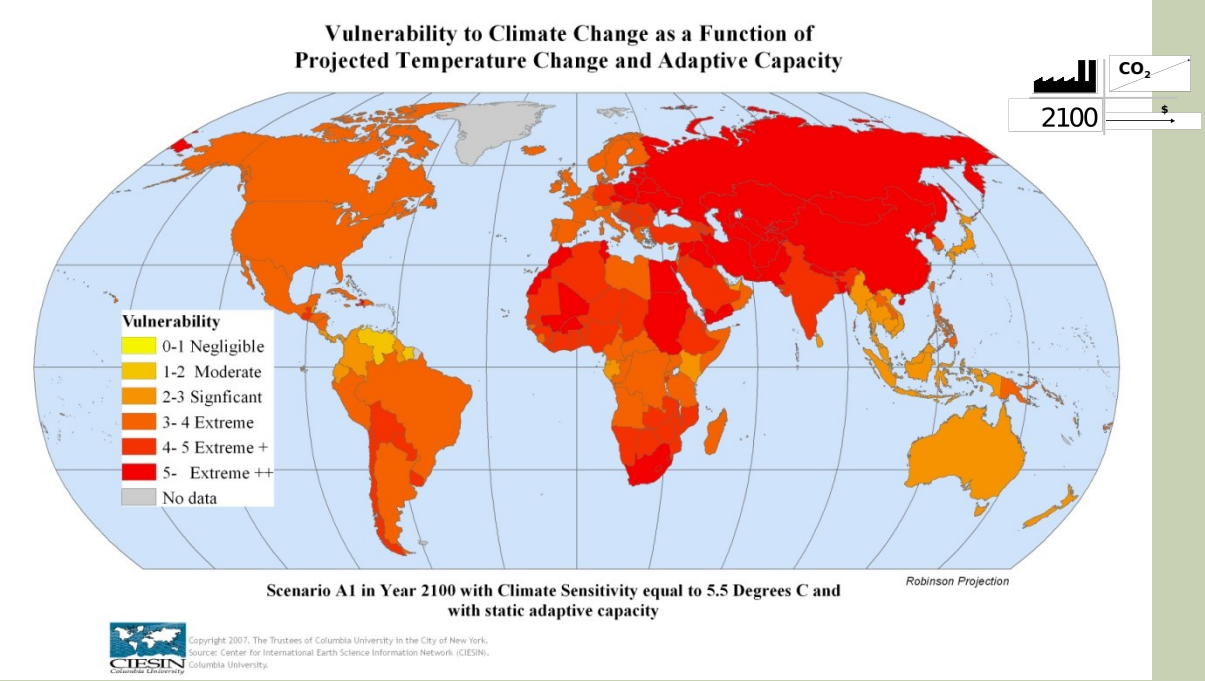
Effect of increasing capacity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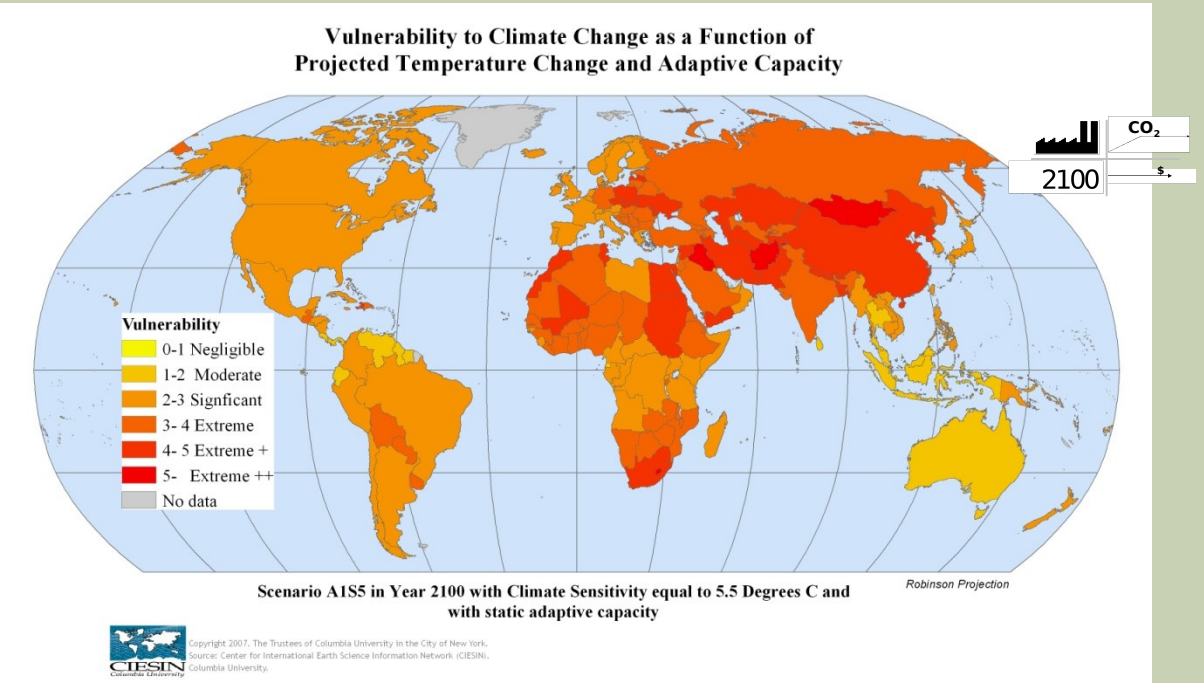
Vulnerability to Climate Change as a Function of
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CO2
2100
$
Vulnerability
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1-2 Moderate
2-3 Signficant
3- 4 Extreme
4- 5 Extreme +
5- Extreme ++
No data
Robinson Projection
Scenario A1S5 in Year 2100 with Climate Sensitivity equal to 5.5 Degrees C and
with static adaptive capacity
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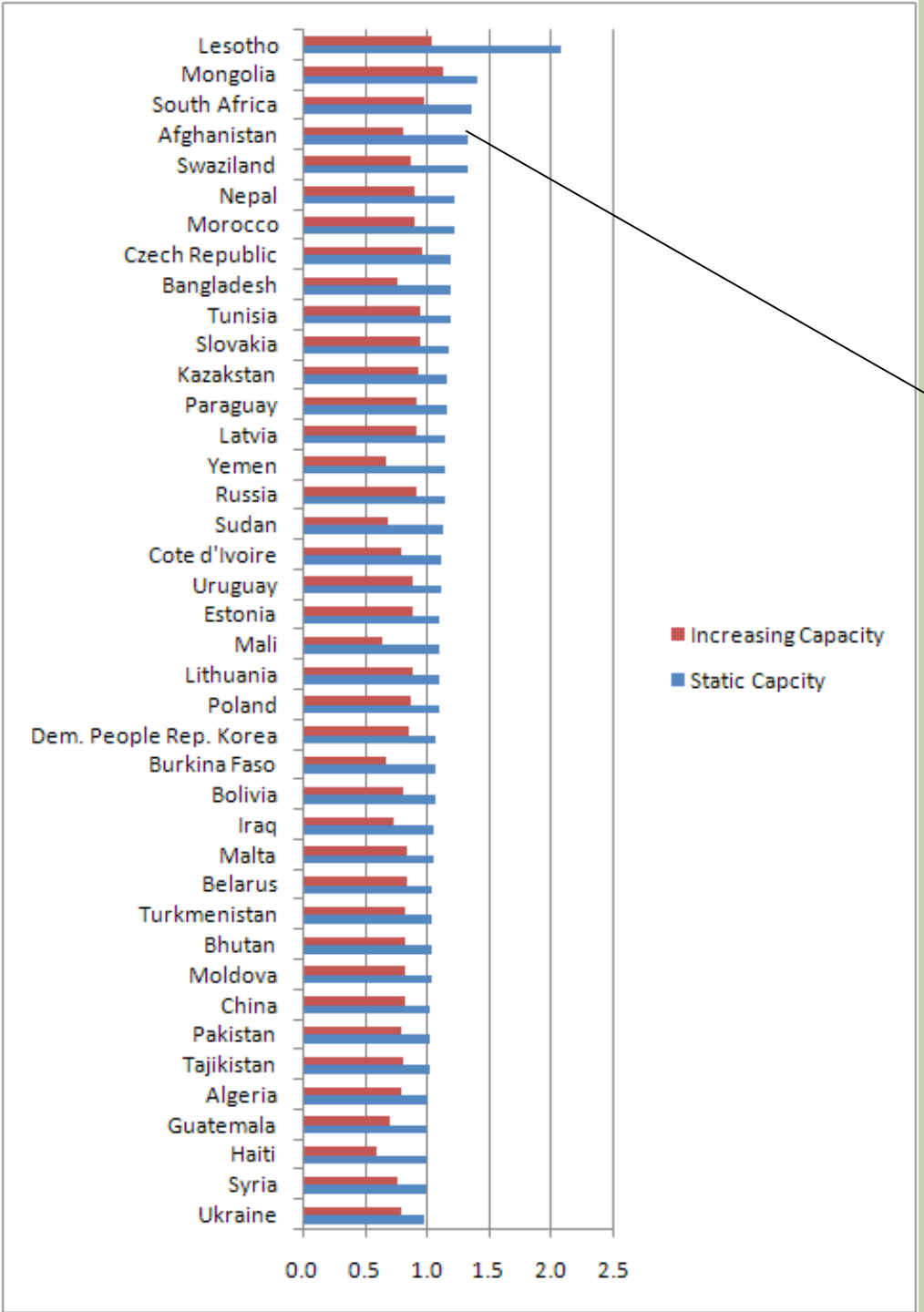
Effect of stabilizing emissions



Afghanistan has 4th-highest projected aggregate vulnerability, taking into account temperature change and adaptive capacity

Global Distribution of Significant Exposure to Hazards, by Number of Hazards

Afghanistan is already a dangerous place

The Multihazard Index was created by summing category values between 8 and 10 across all six natural hazards. This results in a multihazard index that reflects the number of hazards considered relatively significant in a particular grid cell. Overall, more than half of the world's population lives in areas subject to at least one hazard at a significant level.

Source:
Dilley, Maxx, Robert S. Chen, Uwe Deichmann, Arthur L. Lerner-Lam, and Margaret Arnold. 2005. *Natural Disaster Hotspots: A Global Risk Analysis*. Washington, D.C.: World Bank.

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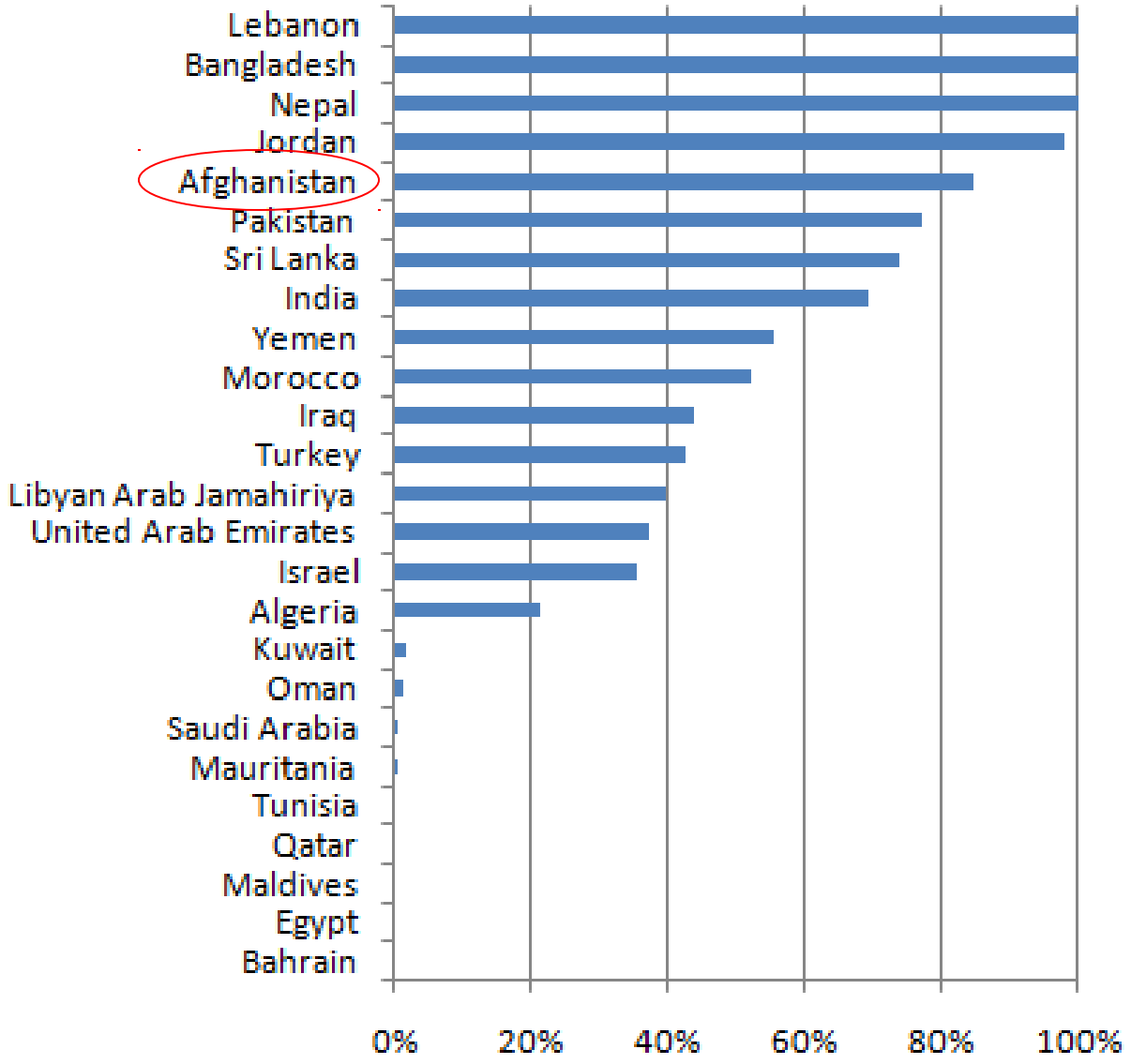
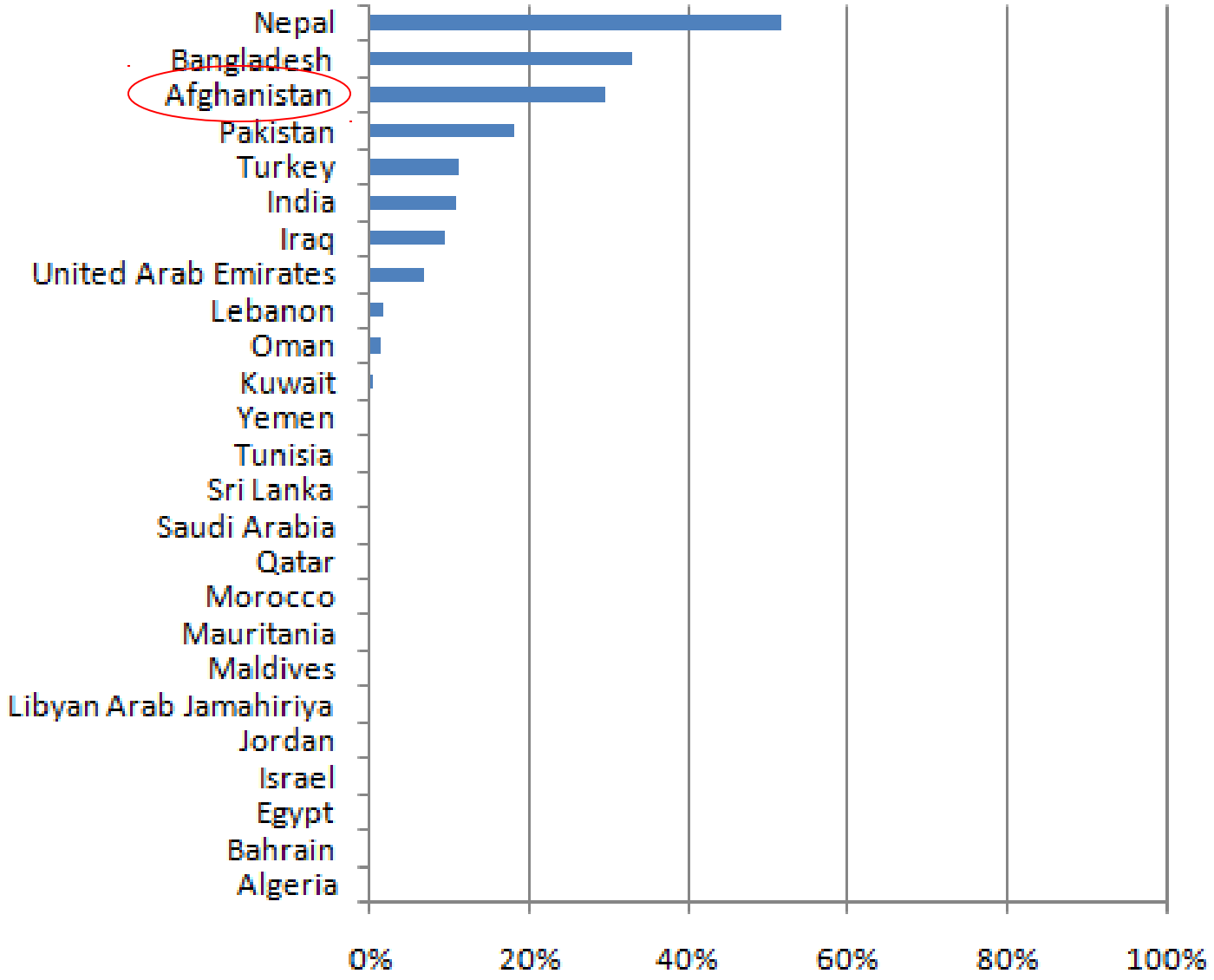
Percentage of Population in 1 Hazard Hotspot



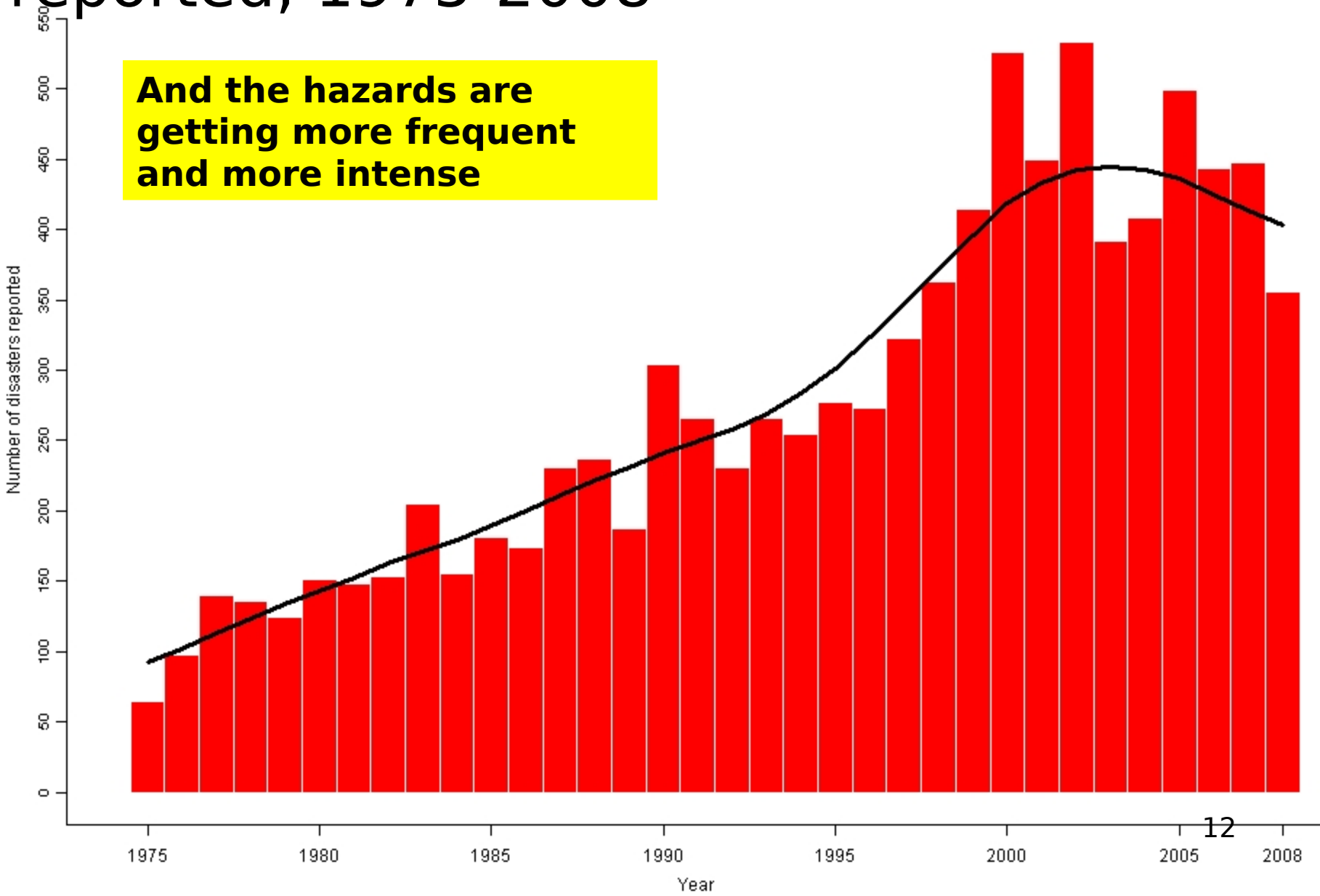
These hotspots are defined by locating places in highest 3 deciles, globally, of physical exposure

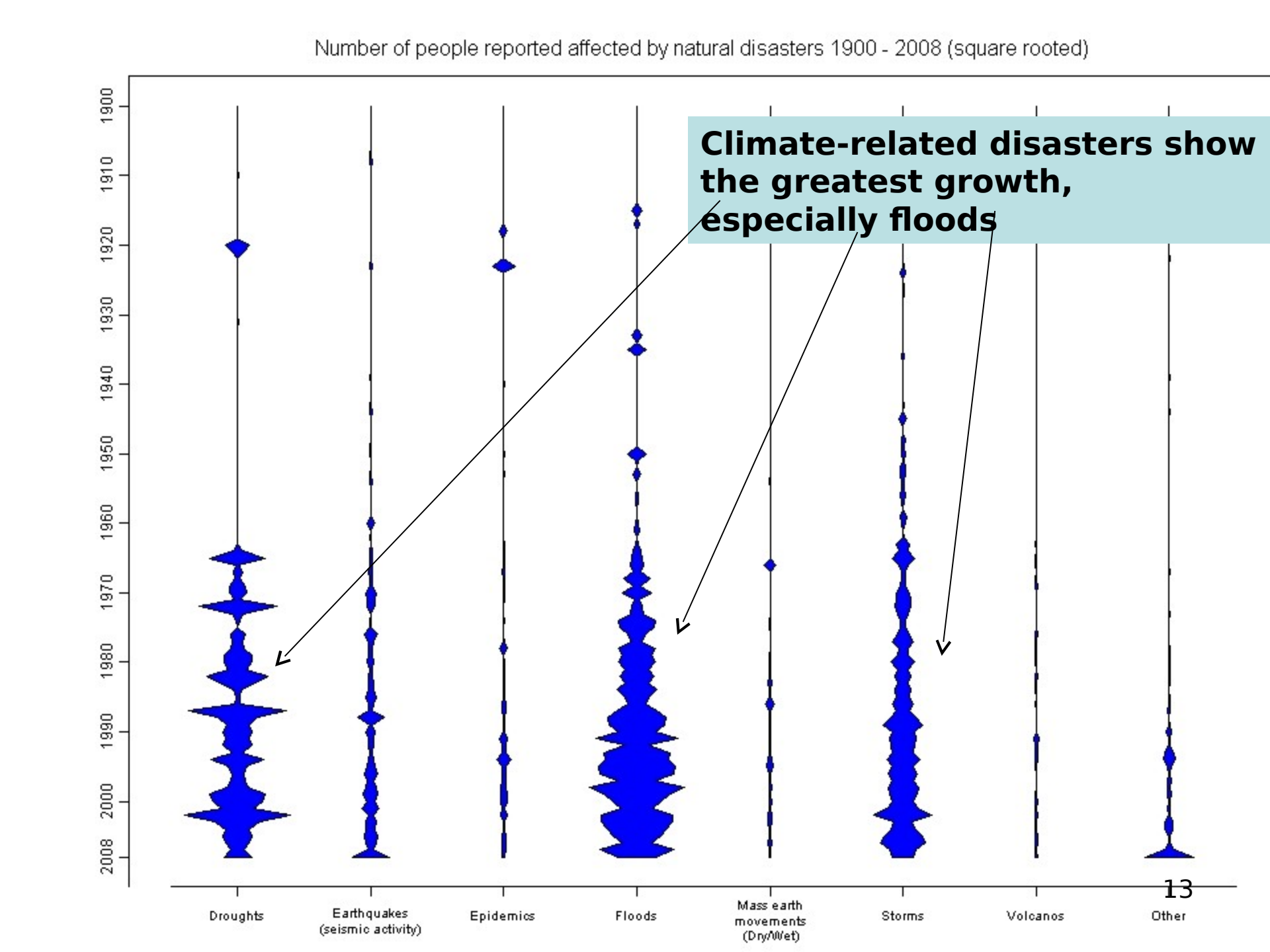
Percentage of Population in 2 Hazard Hotspots



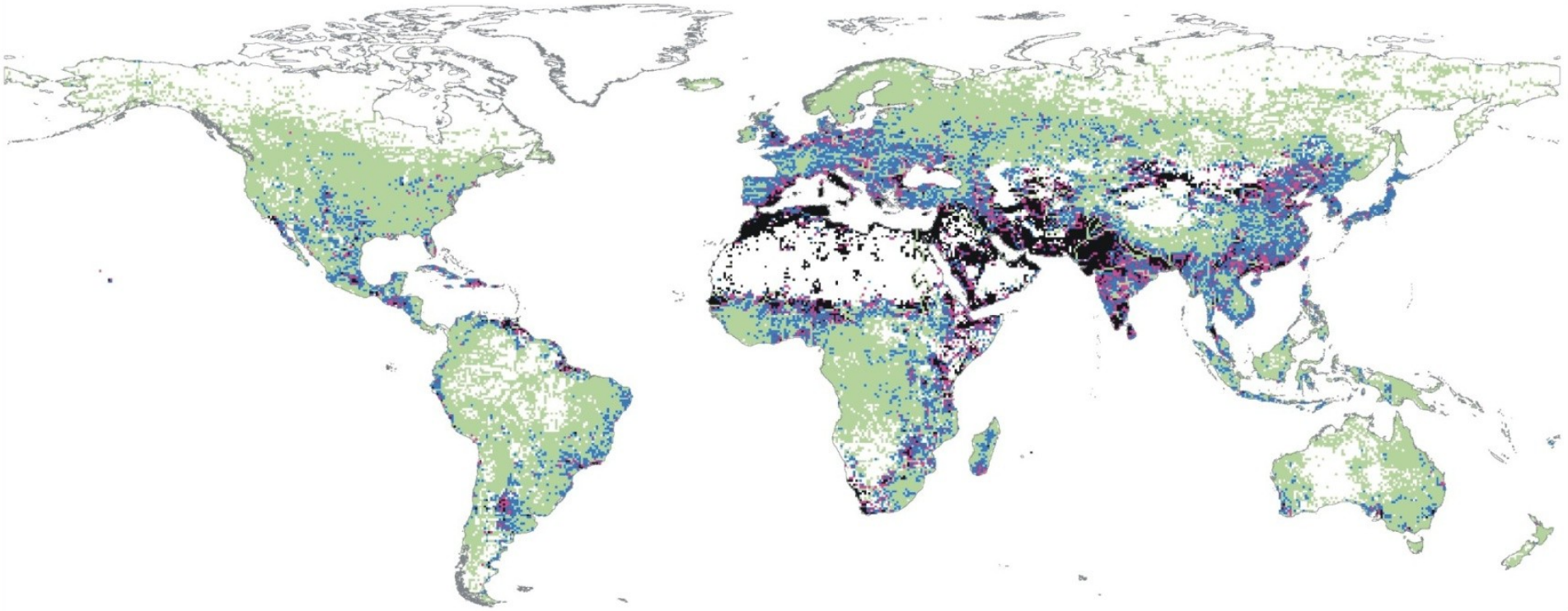
These hotspots are defined by locating places in highest 3 deciles, globally, of physical exposure

Trends in numbers of natural disasters reported, 1975-2008




Number of people reported affected by natural disasters 1900 - 2008 (square rooted)
Climate-related disasters show the greatest growth, especially floods
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2008
Droughts
Earthquakes (seismic activity)
Epidemics
Floods
Mass earth movements (Dry/Wet)
Storms
Volcanos
Other

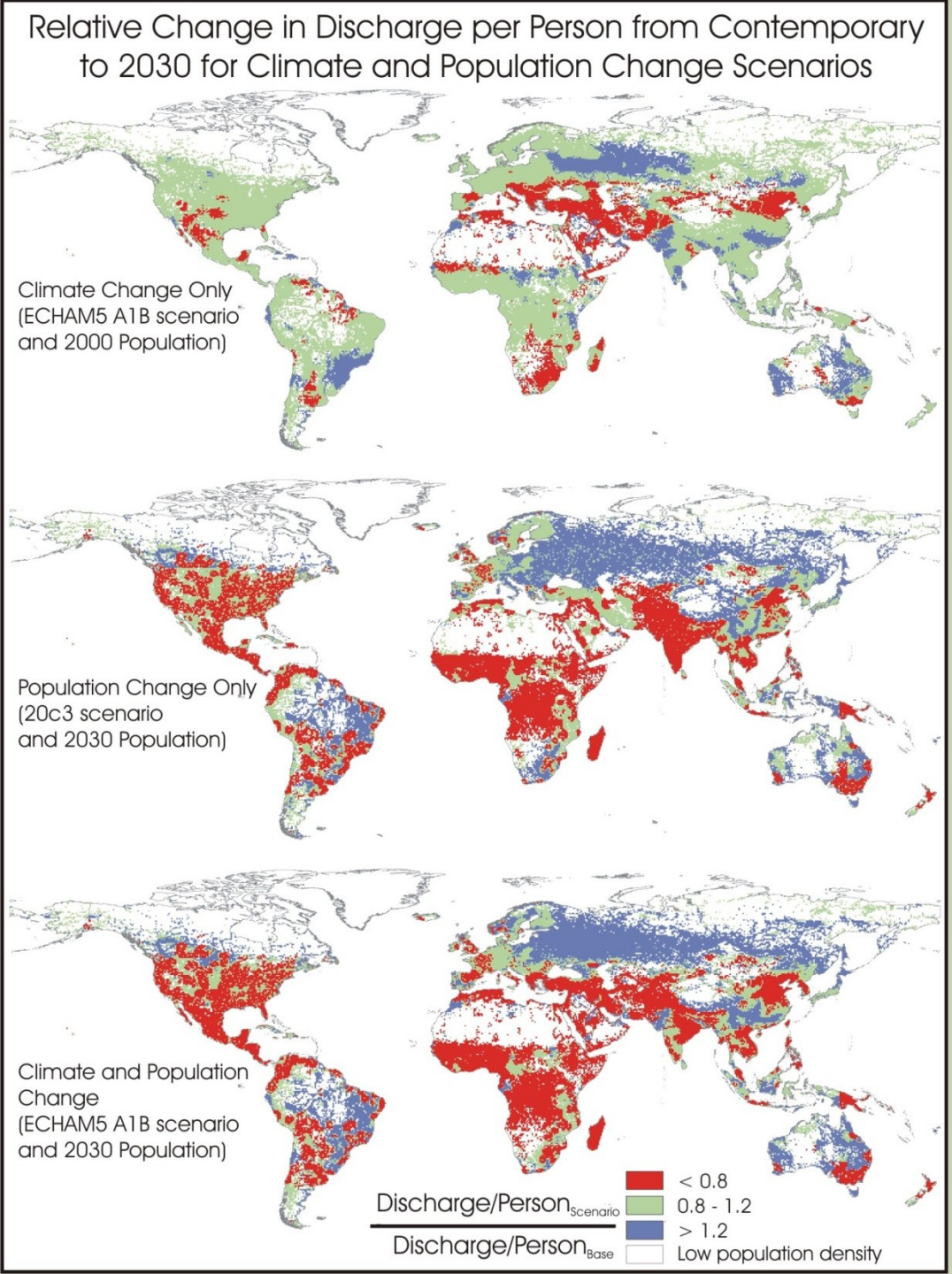
Water Scarcity Index for Contemporary Conditions



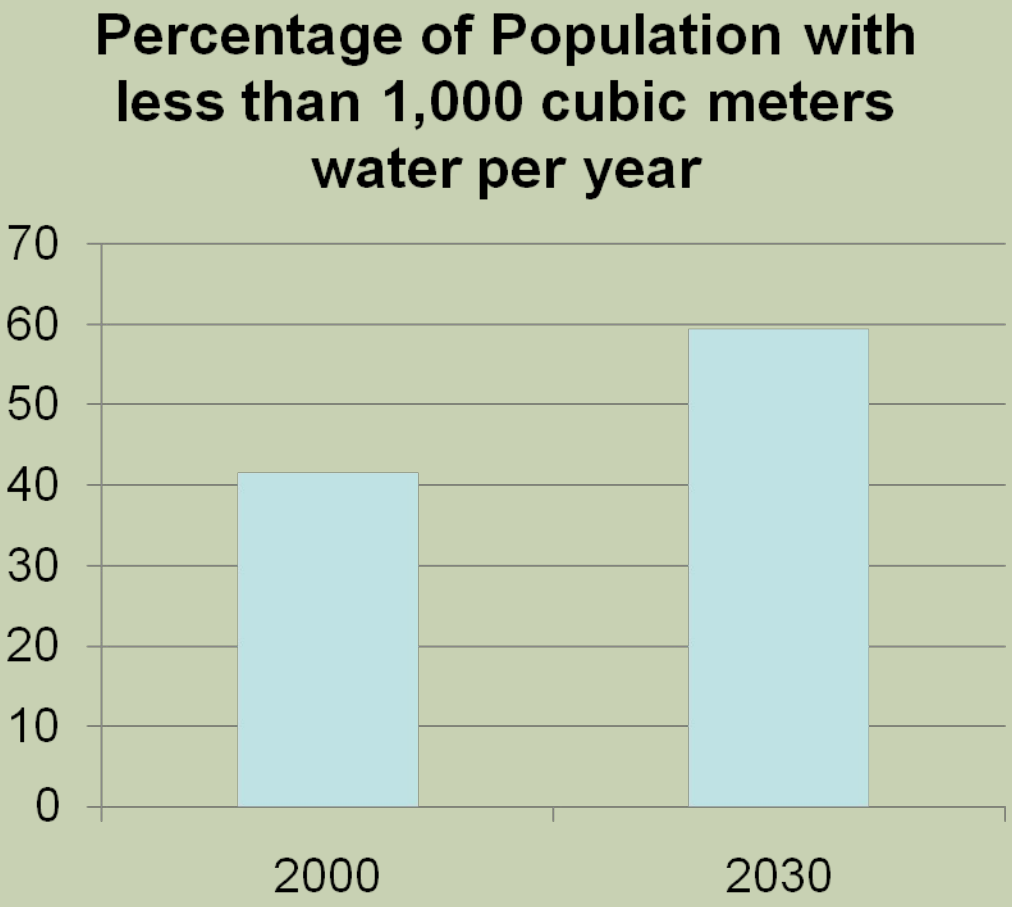
The water scarcity index describes the relationship between water availability and the number of people that can be supported by that water supply. The scarcity index is expressed in terms of the number of people per flow unit where a flow unit of water is equal to 1 million cubic meters per year.

Water Scarcity Index

- Water Barrier (> 2000 people/flow unit)
- Water Scarcity/Stress (600 - 2000 people/flow unit)
- Populations Vulnerable to Water Stress (100 - 600 people/flow unit)
- Adequate Supply (< 100 people/flow unit)
- Low Density Population


Relative Change in Discharge per Person from Contemporary to 2030 for Climate and Population Change Scenarios
Climate Change Only
(ECHAM5 A1B scenario
and 2000 Population)
Population Change Only
(20c3 scenario
and 2030 Population)
Climate and Population
Change
(ECHAM5 A1B scenario
and 2030 Population)
Discharge/Person Scenario
Discharge/Person Base
< 0.8
0.8 - 1.2
> 1.2
Low population density

Water Scarcity Projections within Afghanistan



9.8 million additional water-scarce people

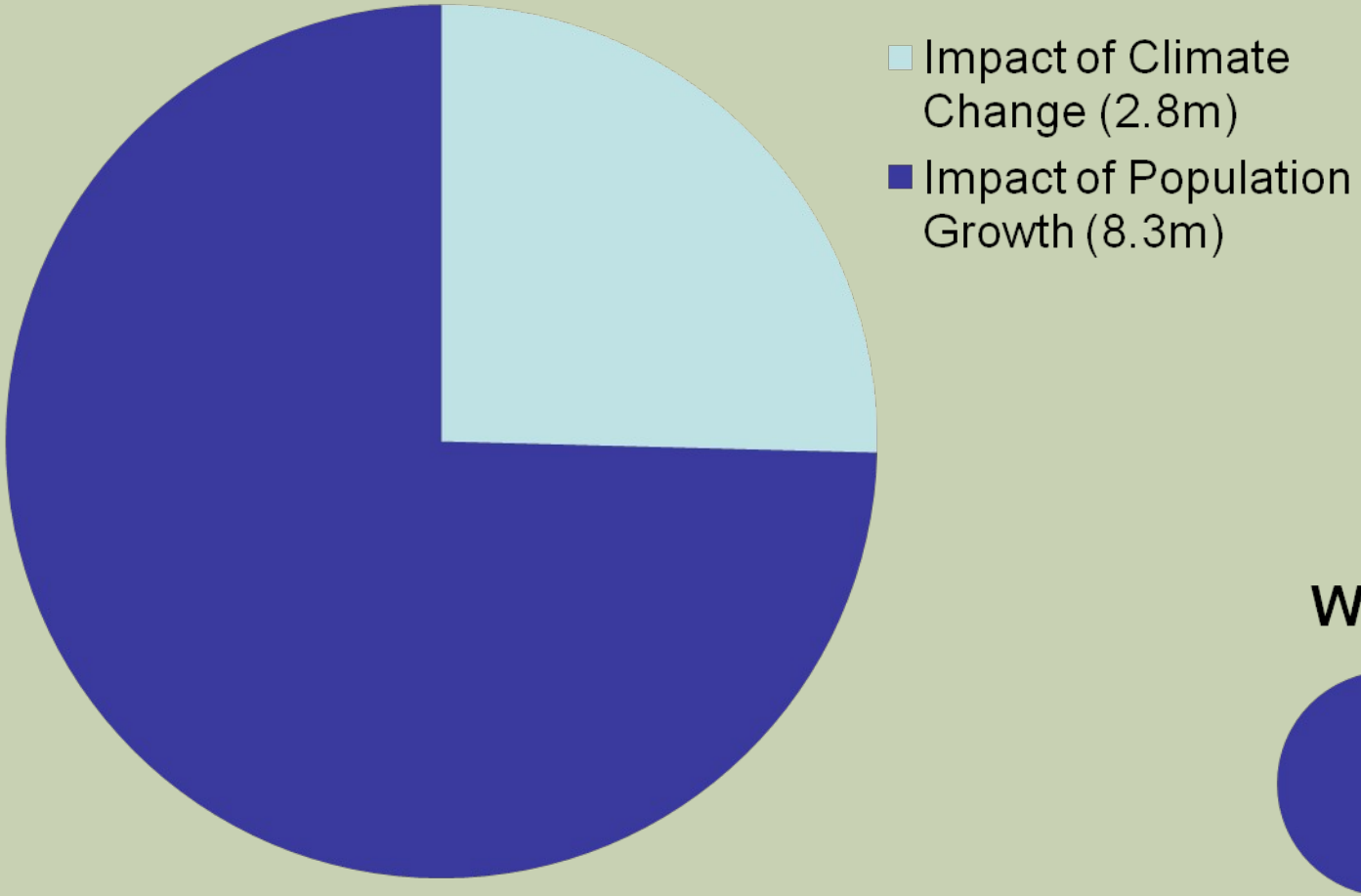
12th-worst in world

Pakistan also high (16 million)
18 percentage-point increase

20th-worst in world

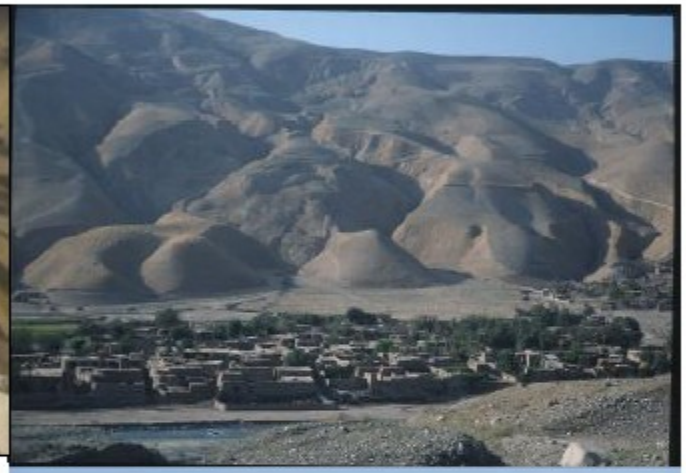
About 10- 16
times average

Most of the increased water scarcity is induced by demographic change



UNEP

80% of the population lives in rural areas and is reliant on natural resources to survive



Climate change and water scarcity will compound existing vulnerabilities and create new ones

Most tree cover has been lost

Air pollution

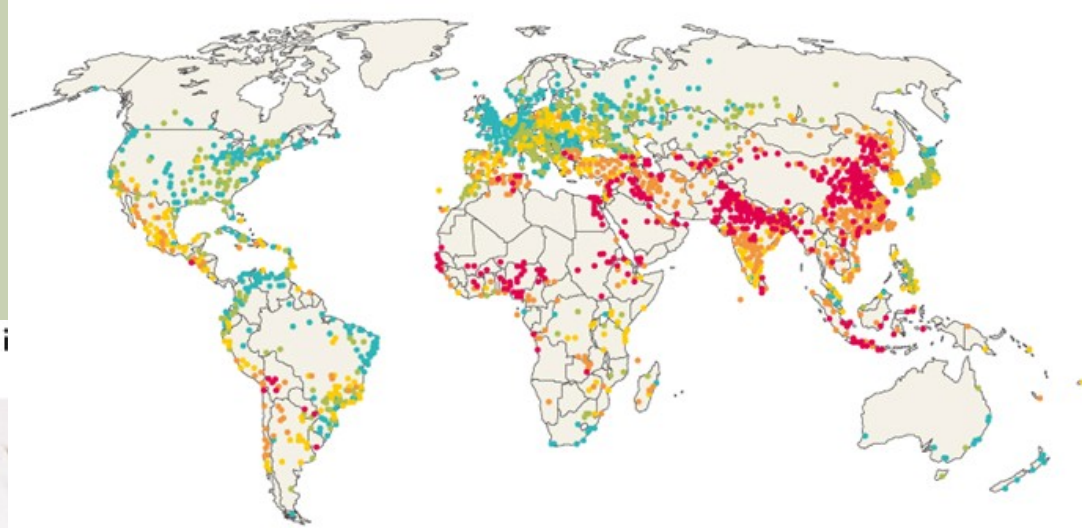


Figure 2.13 The impact of local air pollution on the growth of wheat i

Note: The plants in the centre and on the right were both grown in local air, while the plant on the left was grown in filtered air. The effect of filtering the polluted air increased grain yield by about 40 per cent.

Credit: A. Wahid

Source: UNEP Post-Conflict Environment and Natural Disaster Management Branch

Why environment matters in conflicts and disaster

Since 1990, 17 major conflicts driven by the exploitation of natural resources. Population growth and climate change may compound risks.

Mismanagement of natural resources also increases vulnerability to natural hazards (primarily floods, storms, earthquakes).

Courtesy
UNEP

Field Examples: Afghanistan

ENVIRONMENTAL REHABILIATION CREATES JOBS, SUPPORTS DDR, EMPOWERS COMMUNITIES

Afghan Conservation Corps have planted 5 million trees, built community capacity and generated 700,000 labor days

REDUCES DEMAND FOR SCARCE RESOURCES

Community-led installation of 40 solar panels for electricity. Reducing energy and fuelwood needs.
South-South cooperation with India.

Therefore:

Expect escalating crises around water scarcity, food security, and broad range of climate shocks (pests, disease, etc.). These will reduce security.

Therefore:

Invest in resilience and preparedness now

Photos : UNEP

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